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RADAR BIBLIOGRAPHY FOR GEOSCIENTISTS

by

Robert L. Walters

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Technical Report 61-30

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Center for Research, Inc.
Engineering Science Division
Remote Sensing Laboratory
University of Kansas
Lawrence, Kansas 66044

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ABSTRACT

The purpose of this bibliography is to provide a comprehensive source of background information emphasizing geological, agricultural, geographical, and related interpretations of modern high-resolution, Side-Looking Airborne Radar (SLAR) imagery.

Two hundred sixty-six references are cited and indexed, covering a broad spectrum of subjects from applied imagery analyses and interpretations to selected theoretical studies.

PREFACE

A work of caution to the users of this bibliography--this bibliography was initially prepared as a reference aid for the earth science staff of the Kansas University Center for Research in Engineering Science, Remote Sensing Laboratory. However, enough interest has been expressed by other scientists that the bibliography is being made available as a CRES report. Users will find that many of the cited references are easily obtainable while other references are very difficult or impossible to obtain. The bibliography cites a number of unpublished reports, manuscripts and presented papers which fall under the latter two categories. The unpublished material has been included to make the bibliography as complete as possible and to some extent to indicate chronological development of civilian radar interpretation and usage.

INTRODUCTION

The purpose of this bibliography is to provide a comprehensive source of background information in geoscience interpretation of radar imagery. The geoscience community have become increasingly aware of and interested in applications of radar to their own specific areas of investigation; hence this bibliography and associated index have been provided as a source for such background information. Numerous articles, reports, journals and texts have been examined in the reference acquisition search. Numerous references have been obtained from several excellent bibliographies such as that of P. E. Resta (1965) and J. E. Jones (1966). Among those reports, texts or articles that have extensive reference collections are F. D. Beatty, et al. (1965) and D. Levine, et al. (1966). However, in searching for reference material to be used in conjunction with the University of Kansas radar imagery evaluation efforts, it was determined that no single article, pre-existing bibliography, journal or text contained a comprehensive up-to-date reference collection devoted specifically to the field of radar image interpretation and analysis of natural resource subjects.

Of the imaging type radars, major emphasis has been devoted to the Side-Looking Radars (SLR or SLAR) and secondary emphasis on the Plan Position Indicator (PPI) type radars. A selected number of articles are also included which deal with terrain reflectivity or scatter measurements*, general theory of radar return, scatterometry and general information sources on peripheral subjects intimately related to the general study of radar energy measurements. The volume of reported data in the

*The reader is referred to a bibliography in the open literature on these subjects by H. A. Corriher, Jr. and B. D. Pyron (1965) A Bibliography of Articles on Radar Reflectivity and Related Subjects, 1957-1964; Proceedings of the Electrical and Electronic Engineers (IEEE), vol. 53, no. 8, pp. 1025-1064.

field of terrain reflectivity measurements is massive and only those references are included that are directly contributory to studies of radar imagery.

Initial collection efforts were primarily directed to references devoted to analysis or interpretation, but it soon became apparent that, as in the field of aerial photography where photo interpretation and photogrammetry are intimately related, the rising field of radargrammetry is related to radar image interpretation. Therefore, numerous references are included concerning articles on radargrammetric principles and equipment being used in radargrammetry operations.

Prior to scientific interest in the natural resources applications of radar data, the military was largely responsible for the development of high resolution radars with their map-like image capabilities, and the field of radar interpretation was developed by military intelligence interpreters interested in military information acquisition. Many interpretation principles and procedures developed by the military for target recognition purposes are equally applicable to civilian scientific investigations. This is particularly true with respect to the radar signatures of cultural features such as towns, communication and transportation networks, etc. Therefore, selected references are included, which, although primarily oriented to military purposes, do provide significant guidance to the civilian interpreter for radar signatures of cultural targets. In addition to the included unclassified references, there is a wide range of classified reports available to qualified applicants.

The bibliography was completed during the fall of 1967. Additions since that time period have been included in an Addendum section of the bibliography, and are those numbered 240 and up.

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APPENDIX II - ABBREVIATION EXPLANATION
AND REFERENCE ADDRESSES

1. Aero Service, Inc.
4219 Van Kirk Street
Philadelphia, Pennsylvania 19100
2. Air Force Avionics Laboratory
Research and Technology Division
Air Force Systems Command
Wright-Patterson Air Force Base,
Ohio 45433
3. American Society of Photogrammetry
(ASP) - American Congress on Sur-
veying and Mapping (ACSM)
6269 Leesburg Pike
Falls Church, Virginia 22046
4. Autometric Corp.
(See Raytheon Corp.)
5. Center for Research in Engineering
Science (CRES)
Remote Sensing Laboratory
University of Kansas
Lawrence, Kansas 66044
6. Cornell Aeronautical Laboratory, Inc.
of Cornell University
Buffalo, New York 14214
7. Department of Geography
East Tennessee State University
Johnson City, Tennessee 37602
8. Electronics Research Laboratories
Stanford University
Stanford, California 94305
9. Engineering Experiment Station
Antenna Laboratory
Ohio State University
1320 Kinnear Rd.
Columbus, Ohio 43210
10. Geophysical Sciences Laboratory
Department of Meteorology and
Oceanography
School of Engineering and Science
New York University
University Heights, New York 10453
11. Goodyear Aerospace Corp.
Arizona Division
Litchfield Park, Arizona 85340
12. Institute of Science and Technology
P.O. Box 618
University of Michigan
Ann Arbor, Michigan 48104
13. Laboratory for Agricultural Remote
Sensing
Agricultural Experiment Station
Purdue University
Lafayette, Indiana 47905
14. National Resources Council of Canada
Ottawa, Canada
15. Northrop Aircraft Corp.
Hawthorne, California 90250
16. Raytheon Corp.
Autometric Facility
Space and Information Division
4217 Wheeler Avenue
Alexandria, Virginia 22304
17. Remote Sensing Evaluation and
Coordination Staff (RESECS)
U.S. Geological Survey
Washington, D. C. 20242
18. Texas Instruments, Inc.
Science Services Division
6000 Lemmon Avenue
Dallas, Texas 75204

19. U.S. Air Force Aeronautical Chart
and Information Center (ACIC)
8900 South Broadway
St. Louis, Missouri
20. U.S. Air Force Cambridge Research
Laboratories (AFCRL)
Office of Aerospace Research
L.G. Hanscom Field
Bedford, Massachusetts 02139
21. U.S. Army Cold Regions Research
and Engineering Laboratory (CRREL)
Hanover, New Hampshire 03755
22. U.S. Army Engineer Topographic
Laboratory (ETL) (Formerly known
as U.S. Army Geodesy, Intelligence
and Mapping Research and Develop-
ment Agency, GIMRADA)
Geographic Information Systems Branch
Geographic Information Division
Ft. Belvoir, Virginia 22060
23. U.S. Army Engineer Research and
Development Laboratory (ERDL)
Ft. Belvoir, Virginia 22060
24. U.S. Army Signal Research and
Development Laboratory (SRDL)
Ft. Monmouth, New Jersey 07703
25. U.S. Army Waterways Experiment
Station (WES)
Corps of Engineers
Vicksburg, Mississippi 39181
26. University of Buffalo
Graduate School of Arts and Sciences
Buffalo, New York 14214
27. Westinghouse Electric Corp.
Aerospace Division
Friendship International Airport
P.O. Box 746
Baltimore, Maryland 21240
28. Westgate Laboratory, Inc.
506 S. High
Yellow Springs, Ohio 45387
29. Woods Hole Oceanographic Institute
Woods Hole, Massachusetts 02543